

How Changes in Assumptions Can Affect Budget Projections

The federal budget is highly sensitive to economic conditions. Revenues depend on taxable income—including wages and salaries, interest and other nonwage income, and corporate profits—which generally moves in step with overall economic activity. The benefits of many entitlement programs are pegged to inflation either directly (as with Social Security) or indirectly (as with Medicaid). In addition, the Treasury regularly refinances portions of the government's debt at market interest rates, so the level of federal spending for interest on that debt is directly tied to such market rates.

To illustrate how assumptions about key economic factors can affect federal budget projections, the Congressional Budget Office (CBO) uses what it terms rules of thumb. Those rules are rough orders of magnitude for gauging how changes in individual economic variables, taken in isolation, will affect the budget's totals.

The variables that figure in those rules of thumb are real (inflation-adjusted) growth, interest rates, and inflation. For real growth, CBO's rule shows the effects of a rate that is 0.1 percentage point lower each year, beginning in January 2002, than the assumed rate of growth underlying CBO's baseline projections (that rate and other economic assumptions are outlined in Chapter 2). The rules for interest rates and inflation assume an increase of 1 percentage point over the rates in the baseline, also starting in January 2002.

Each rule is roughly symmetrical. Thus, the effects of higher growth, lower interest rates, or lower

inflation would have about the same magnitude as the effects shown in this appendix, but with the opposite sign.

The calculations that appear in this appendix are merely illustrative of the impact that changes in assumptions can have. CBO uses variations of 0.1 percentage point or 1 percentage point for the sake of simplicity; they should not be viewed as typical forecasting inaccuracies. (For details about the accuracy of CBO's past budget projections, see Chapter 5.) Furthermore, readers should be careful about extrapolating from small, incremental rule-of-thumb calculations to much larger changes, because the magnitude of the effect of a larger change is not necessarily a multiple of a smaller change. Moreover, budget projections are subject to other kinds of inaccuracies that are not directly related to economic forecasting.

In addition to the rules of thumb related to economic projections, CBO presents two rules that deal with the levels of projected surpluses. The first illustrates the impact on projections of discretionary spending of adding \$10 billion to CBO's estimate of budget authority for 2002. The second shows the effect on net interest payments of borrowing \$10 billion less than anticipated.

Lower Real Growth

Strong economic growth improves the federal budget's bottom line, and weak economic growth wors-

ens it. The first economic rule of thumb outlines the budgetary impact of economic growth that is slightly weaker than CBO's baseline assumes. Specifically, the rule illustrates the effects of growth rates for real gross domestic product (GDP) that are lower by 0.1 percentage point every year from January 2002 through 2012.

Those effects differ from the effects of a cyclical change, such as a recession, which are much shorter-term in nature. (For scenarios involving cyclical economic changes, see Chapter 5.) Moreover, CBO's rule for GDP uses 0.1 percentage point—rather than the full percentage point used in the interest rate and inflation rules—because projected real growth is unlikely to differ from actual growth by such a large amount over the next 10 years. A difference as large as 1 percentage point might occur for a few years, however, as a result of a cyclical change.

The baseline projects that real GDP will grow by an average of about 3.1 percent a year. Subtracting 0.1 percentage point from that rate each year means that the level of GDP would lie roughly 1 percent below CBO's baseline assumption by 2012.

A lower rate of growth for GDP would have a number of budgetary implications. For example, it would suggest slower growth of taxable income, leading to shortfalls in revenues that would mount from \$1 billion in 2002 to \$42 billion in 2012 (see Table A-1). Cumulatively, revenues would be \$196 billion lower over the 2003-2012 period than CBO now projects. Lower growth of GDP would also mean that the government borrowed more and incurred greater interest costs on its debt. Those debt-service costs would be minimally affected during the first few years of the projection period, but in later years, those costs would gradually rise, by as much as \$11 billion in 2012. Altogether, those changes (along with small effects on the earned income tax credit and Medicare) would reduce the projected surplus for 2012 by \$53 billion. In sum, if growth of real GDP was 0.1 percentage point a year lower than the rate assumed in CBO's baseline, surpluses would be a total of \$51 billion smaller over the 2003-2007 period and \$234 billion smaller over the 2003-2012 period.

Higher Interest Rates

CBO's second rule of thumb illustrates the sensitivity of the budget to changes in interest rates, which affect the flow of interest to and from the federal government. When the budget is in surplus, the Treasury uses some of its income to reduce debt held by the public, but it also refinances some debt at market interest rates. When the budget is in deficit, the Treasury must borrow additional funds from the public to cover any shortfall.

If interest rates were 1 percentage point higher than in the baseline for all maturities of debt each year and all other economic variables were unchanged, interest costs would be approximately \$6 billion higher in 2002 (see Table A-1). That initial boost in interest costs would be fueled largely by the extra costs of refinancing the government's short-term Treasury bills (those with maturities of one year or less), which make up about 25 percent of the marketable debt. More than \$730 billion of Treasury bills are currently outstanding, all of which mature within the next year.

The bulk of marketable debt, however, consists of medium-term notes and long-term bonds, which were issued with maturities of two to 30 years. As those longer-term securities mature, they will be replaced with new issues (the Treasury has stopped issuing 30-year bonds, but it continues to issue two-, five-, and 10-year notes). Thus, the budgetary effects of a change in interest rates would mount; the effect of interest rates that were 1 percentage point higher each year than in the baseline would peak at \$22 billion in 2006 and 2007.

After 2007, however, the effect of higher interest rates would diminish. As projected baseline surpluses continued to rise, the stock of debt held by the public would be reduced, so fewer securities would be expected to roll over each year. By 2012, the effect of higher interest rates would drop to \$11 billion, but the effect of increased debt over the 10-year period would add another \$16 billion to interest costs in that year. In sum, the interest rate rule of thumb would cause the cumulative surplus to decline by \$117 billion from 2003 through 2007 and by \$267 billion from 2003 through 2012.

Table A-1.
Estimated Effects of Selected Economic Changes on CBO's Budget Projections (In billions of dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total, 2003- 2007	Total, 2003- 2012
Growth Rate of Real GDP Is 0.1 Percentage Point Lower per Year													
Change in Revenues	-1	-3	-6	-9	-12	-16	-20	-24	-29	-35	-42	-46	-196
Change in Outlays													
Net interest (Debt service)	*	*	*	1	1	2	3	5	6	9	11	5	39
Mandatory spending	*	*	*	—	—	—	—	—	—	—	—	—	—1
Total	*	*	*	1	1	2	3	5	6	8	11	5	38
Change in Surplus	-1	-3	-6	-10	-13	-18	-23	-29	-35	-43	-53	-51	-234
Interest Rates Are 1 Percentage Point Higher per Year													
Change in Revenues	0	0	0	0	0	0	0	0	0	0	0	0	0
Change in Outlays													
Higher rates	6	15	19	21	22	22	21	20	18	16	11	99	185
Debt service	—*	—1	—2	—3	—5	—7	—9	—11	—13	—15	—16	—18	—81
Total	6	16	21	24	27	29	30	31	31	30	27	117	267
Change in Surplus	-6	-16	-21	-24	-27	-29	-30	-31	-31	-30	-27	-117	-267
Inflation Is 1 Percentage Point Higher per Year													
Change in Revenues	12	35	59	86	114	147	185	229	281	339	405	441	1,880
Change in Outlays													
Higher rates	7	17	21	22	23	24	23	22	20	17	12	107	200
Debt service	*	*	*	-1	-2	-4	-6	-9	-14	-20	-30	-8	-87
Discretionary spending	0	4	10	18	25	34	43	52	63	73	84	91	407
Mandatory spending	—*	—10	—22	—36	—50	—66	—84	—103	—124	—148	—171	—183	—814
Total	7	31	52	74	97	120	144	168	193	218	238	373	1,334
Change in Surplus	5	4	7	12	17	27	41	61	88	121	167	68	546

SOURCE: Congressional Budget Office.

NOTE: * = between -\$500 million and \$500 million.

Higher Inflation

The third rule of thumb shows the budgetary impact of inflation that is 1 percentage point higher each year than the baseline projects. The effects of inflation on federal revenues and outlays partly offset each other. On the one hand, higher inflation and its

assumed effects on wages and other income lead to greater revenues. On the other hand, higher inflation increases spending for many benefit programs (although with a lag), as well as baseline projections of discretionary spending. In deriving this rule of thumb, CBO also assumes that nominal interest rates rise in step with inflation, thus increasing the cost of financing the government's debt.

An increase of 1 percentage point per year in projected inflation from 2002 through 2012 would boost revenues by \$405 billion and outlays by \$238 billion in 2012 (see Table A-1). The combined effect of those changes would be to increase the surplus in 2012 by \$167 billion. Over the 2003-2007 period, the projected surplus would grow by \$68 billion; over the 2003-2012 period, it would increase by \$546 billion.

Higher Discretionary Budget Authority

Discretionary spending is not directly related to economic conditions but rather to the level of appropriations provided by the Congress and the rate at which such appropriations are spent. CBO's baseline projections assume that appropriations for the current year—in this case, 2002—grow at the specified rates of inflation in the years to follow (as specified by the Balanced Budget and Emergency Deficit Control Act of 1985). Nevertheless, it may be useful to estimate the sensitivity of discretionary outlays (and thus the surplus or deficit) to changes in discretionary budget authority that are unrelated to changes in economic assumptions.

Budget authority is the legal authority to incur financial obligations that will result in immediate or future outlays of federal government funds. The Congress appropriates such budget authority for discretionary programs annually in appropriation acts; outlays from that authority may occur in the year that the authority is granted or in subsequent years. Fast-spending activities (such as meeting payrolls or directly providing services) generally expend most of their budget authority in the year that it is granted; slow-spending activities (such as procuring weapons or building roads and other infrastructure) spend their authority over a longer period of time.

As a result, changes in budget authority for different activities do not immediately translate into equal changes in outlays. CBO estimates that, on average, approximately 60 percent of budget authority for discretionary spending is spent in the year that it is granted. Therefore, an additional \$10 billion in budget authority in 2002 would lead to \$6 billion more in outlays that year. The remaining \$4 billion would be spent over the next few years.

Under the rules that govern CBO's baseline, providing \$10 billion more in budget authority in 2002 would lead to an increase of \$13 billion in projected budget authority in 2012 (see Table A-2). Spending that additional budget authority would lead to \$51 billion more in outlays between 2003 and 2007 and \$111 billion more over the 2003-2012 period.

Table A-2.
Estimated Effects on CBO's Baseline of Increasing Discretionary Budget Authority by \$10 Billion in 2002
(In billions of dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total, 2003- 2007	Total, 2003- 2012
Budget Authority	10	10	11	11	11	11	12	12	12	13	13	54	116
Outlays	6	9	10	10	11	11	11	12	12	12	13	51	111

SOURCE: Congressional Budget Office.

NOTE: CBO assumes that budget authority grows at the rates of inflation specified in the Balanced Budget and Emergency Deficit Control Act of 1985 (the GDP deflator and employment cost index for wages and salaries).

Increase in the Surplus or Decrease in the Deficit

CBO’s projections of net interest costs are consistent with its projections of future interest rates and debt held by the public. Changes from year to year in debt held by the public depend mostly on the size of the surplus or deficit. If surpluses or deficits differed from those projected in the baseline—for whatever reason—interest costs would also change.

A one-time decrease of \$10 billion in the deficit in 2002 would enable the Treasury to redeem an ad-

ditional \$10 billion in debt that year, compared with the assumption in CBO’s baseline. Removing that debt from the outstanding stock would save \$0.1 billion in net interest in 2002 and nearly \$1 billion a year by 2012 (see Table A-3). (Savings in later years would stem from the compounding effect of debt reduction in 2002.)

Interest savings would be even greater if the \$10 billion decrease in borrowing was sustained in every year through 2012. In that case, savings from additional debt reduction and the compounding effect of such savings would increase the projected surplus in 2012 by \$7.4 billion.

Table A-3.
Estimated Savings in Net Interest from Borrowing \$10 Billion Less (In billions of dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total, 2003- 2007	Total, 2003- 2012
Savings from Borrowing \$10 Billion Less in 2002 Only	-0.1	-0.4	-0.5	-0.6	-0.6	-0.6	-0.7	-0.7	-0.8	-0.8	-0.9	-2.7	-6.6
Savings from Borrowing \$10 Billion Less Each Year	-0.1	-0.7	-1.3	-2.0	-2.6	-3.3	-4.1	-4.8	-5.6	-6.5	-7.4	-9.9	-38.3

SOURCE: Congressional Budget Office.